flightpath were varied to determine their effect on encounter probability. The uncertainty in the position of the leading and trailing aircraft was also varied in the study to cover the various levels of location accuracy achievable with the conventional instrument landing system, and with the significant improvement in the location accuracy achievable with the Local Area Augmentation System (LAAS). The LAAS is a landing-guidance system that is based on the Global Positioning Satellite System (GPSS). These simulation studies demonstrated that by implementing a more accurate aircraft positioning system based on GPSS and improving the wind measurements along the flightpath of the wake-generating aircraft, a significant reduction could be realized in the probability of a wake-vortex encounter by a trailing aircraft. That is, for the same procedures currently in use, the foregoing improvements would translate into a potential reduction in spacing, while maintaining safety margins that are the same or greater than those in current use. The study also suggests that the proposed reduction in uncertainties may provide an ability to develop radically new and much more effective wake-vortex avoidance procedures that would not be possible with the current system at airports. For example, it may be possible to safely arrange a sequence of multiple flight corridors to airports that have a large landing surface area, instead of separate runways that accommodate only single flight corridors.

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Remote Tower Sensor System

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The Remote Tower Sensor System (RTSS) is a proof-of-concept prototype being developed by Ames Research Center in collaboration with the Federal Aviation Administration (FAA) and the National Oceanic and Atmospheric Administration (NOAA). Once fully installed, the system will greatly help San Francisco International Airport (SFO) improve predictions of landing conditions during weather transition periods by providing a better understanding of the formation and dissipation of clouds, weather, and wind currents in and around the airport approach zone. The project utilizes live video that is accessible over a secure Internet site. The camera system employs advanced image processing technologies to help controllers and forecasters understand and predict critical weather situations. RTSS is leveraging off the existing Airport Approach Zone Camera System (AAZCS) project of real-time weather observations at SFO.

In FY00 the RTSS team set up a portable remote tower sensor test bed on the roof of building 269 at Ames (see fig. 1). Once testing is completed, this portable remote tower will be deployed at Half Moon Bay Airport as the first "virtual tower system" that will integrate real-time airport data in support of operations at airports without towers. Some of the key components consist of an ultrasonic wind sensor, air-temperature and relative humidity sensor, barometric pressure sensor, solar panels, wireless Ethernet, PTZ (Pan-Tilt-Zoom) motion camera, web access and logging.

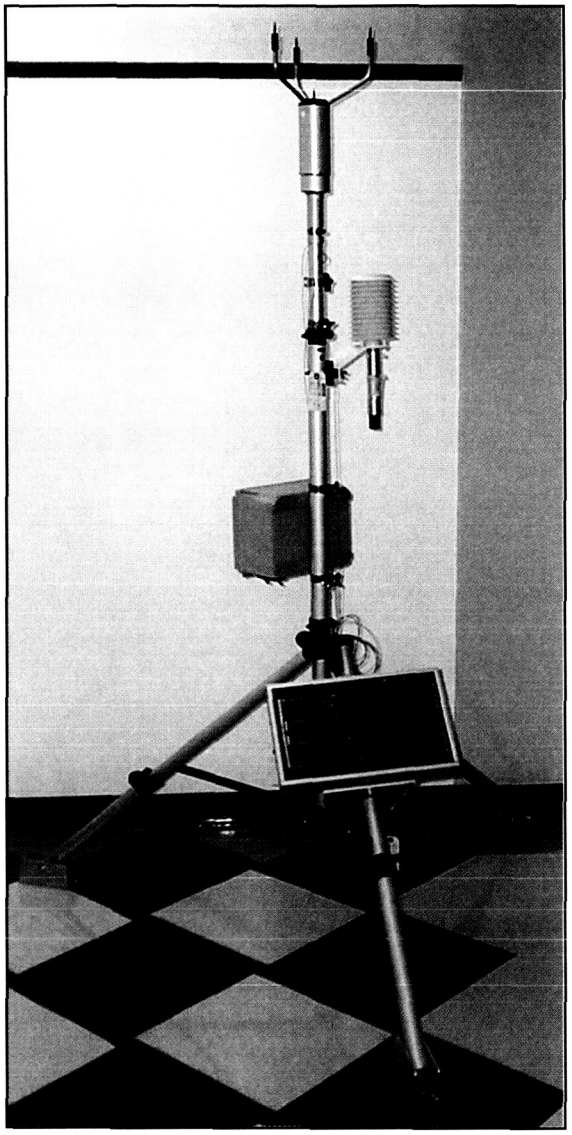

Fig 1. The Portable Remote Tower Sensor Test Bed.

On 3 March 2000 digital cameras were brought on-line at the Seattle/Tacoma (SEATAC) Tower, permitting for the first time, real-time monitoring of airport operations/weather for the tower management and TRACON.

A third part of the system came into being in June 2000 when the RTSS team set up an infrared camera test bed at SFO to measure and quantify weather-related visibility owing to low-cloud dissipation and fog surrounding the airport. The 4-day test consisted of installing the forward-looking infrared (FLIR) Alpha Indigo infrared camera system and a dual-mode visible/infrared camera onto the lower portion of the air-traffic control (ATC) tower, collecting and recording high-resolution video feeds from the cameras, and analyzing the data. RTSS can be utilized at both airports without towers as well as at major airport hubs for synthetic vision augmentation or local as well as remote low/zero visibility operations.

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Boeing 777 Landing Gear Noise Study

Paul Soderman, Clif Horne

As an integral part of NASA's goal to reduce aircraft noise, efforts are under way to develop the technology to measure and attenuate airframe noise generated by various components of transport aircraft. Noise caused by approach-deployed landing gear on modern transport aircraft is comparable to that from other airframe noise sources (excluding the engines). Total airframe noise is comparable to engine noise on approach. To understand and alleviate the problem, Ames Research Center personnel, in collaboration with